

ULYSSES OBSERVATIONS OF A PAIR OF SLOW' MODE SHOCKS INSIDE A CORONAL MASS EJECTION

E. J. Smith (1), M. E. Burton (1), D. J. McComas (2) and
K. A. Anderson (3)

(1) Jet Propulsion Laboratory, Pasadena, CA. (2) Los Alamos National
Laboratory, Los Alamos, NM. (3) University of California,
Berkeley, CA.

esmith@jplsp.jpl.nasa.gov / Fax: 818-353-8895

From February 3-5 1995, as Ulysses was approaching the ecliptic at 24 °S latitude, it was intercepted by the first CME that had been seen in many months. The CME was of the "over-expansion" type seen previously at high latitudes and was accompanied by energetic ions and electrons. The magnetic field and plasma measurements revealed a signature within the CME similar to that first seen in the Earth's distant magnetotail by ISEE-3. The latter signature has been identified as a pair of slow mode shocks bounding a region (plasma sheet) containing reconnected field lines. Analysis of the Ulysses data has confirmed that a pair of slow mode shocks are present at the boundaries of this structure. In addition, a current sheet, across which the field reverses direction, has been found to lie between the shocks. The energetic particles appear to be affected by these discontinuities. The existence of this complex structure inside a CME is striking, not having been reported previously. It suggests magnetic reconnection within the CME at an x-type neutral point, evidence of which has proven elusive in the past.

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| 1. E. J. Smith, Jet Propulsion Lab.
4800 Oak Grove Dr. M/S 169-506
Pasadena, CA 91109, USA.
Fax: 818-354-8895
esmith@jplsp.jpl.nasa.gov | 4. Standard Equipment. |
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| 3. R. G. Marsden (Noordwijk),
E. Marsch (Katlenburg-Lindau). | 6. N/A |